an interferometer measuring element, that uses imaging interferometry to measure a position of an object; and

an object moving device, moving said object while said position is being measured.

2. (Amended) A device as in claim 1, further comprising [a modulatable light source, and] a synchronization device, which synchronizes said moving with [modulation of] said pulsation of said light source.

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3. (Amended) An optical measuring device, comprising:

a chamber, having a transparent viewport, and a holding element for an object to be measured inside said chamber;

an interferometer measuring element, that uses imaging interferometry to measure a position of the object while in said chamber by forming a main arm including said object, and a reference arm that does not include said object, wherein said reference arm includes a pulsating light source.

4. (Unchanged) A device as in claim 3, wherein said reference arm includes a compensating plate that compensates for optical effects of said viewport.

5. (Unchanged) A device as in claim 4, further comprising an object moving device, moving said object while said position is being measured.

6. (Unchanged) An optical measuring device, comprising:

a light source capable of [modulation] pulsation at a rate greater than 10 Khz;

a sample interface device, adapted to hold a sample to be imaged, and including an ability to move said sample at a predetermined repetition rate;

a signal generator, producing a pulse output for said light source, and a periodic signal output for said sample interface device, said outputs having a predetermined relationship with one another; and

an interferometer movement detecting device, producing, at each pulse of light output from said light source, an interferometric measurement of a position of a sample on said sample interface device.

7. (Unchanged) A device as in claim 6, wherein said interferometric device comprises a first arm producing a sample beam, and a second arm producing a reference beam, and producing an interference between said sample and reference beams.

8. (Unchanged) A device as in claim 7, wherein said sample interface device includes an enclosed area, with a transparent viewport through which said sample beam enters; and

a compensating plate, placed in said reference arm, to compensate for effects of said viewport.

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9. (Unchanged) A device as in claim 7, wherein said interferometer is a Michelson interferometer.

10. (Unchanged) A device as in claim 7, further comprising a camera, imaging results of said interferometer movement detection device.

11. (Unchanged) A device as in claim 7, wherein said sample is a MEMS device, and said signal generator is

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capable of varying a phase between said light source and said movement of said MEMS device.

12. (Amended) A device as in claim 7, wherein said pulse generator produces a strobe output, having a pulse width during which the sample will not move [enough to blur an interferometric measurement] more than a distance of about 1/20th of a center wavelength of the light source.

13. (Unchanged) A device as in claim 12, further comprising a camera, acquiring said interference.

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14. (Unchanged) A device as in claim 12, further comprising a processor, measuring said interference, and integrating the measuring over a plurality of cycles.

15. (Amended) An optical measuring device, comprising:

a light emitting diode;

a sample interface device, adapted to hold a sample to be imaged, and including a vacuum-tight chamber with a transparent viewing portion, and including an ability to move said sample at a predetermined repetition rate;

a signal generator, producing a pulse output for said light emitting diode to produce a pulse of light from said light emitting diode, and a periodic signal output for said sample interface device, said outputs having a predetermined phased relationship with one another such that said pulse of light occurs at a predetermined point in a movement of said sample; and

an interferometer movement detecting device, producing an interferometric measurement of a position of a sample on said sample interface device based on reflections of light from said light source, said interferometer movement [measuring] detecting device including a reference arm with a compensating plate therein that compensates for the effect of said transparent viewing portion.

16. (Unchanged) A device as in claim 15, wherein said interferometer movement detecting device integrates said reflections for a plurality of said pulses of light.

17. (Amended) A method of measuring a characteristic of a moving device using optical interferometry, comprising:

moving a sample to be imaged at a predetermined repetition rate;

illuminating said sample using pulses of light, that occur for time periods that are short enough that said sample will not have moved [enough to blur an interferometric measurement] more than a distance of about 1/20th of a center wavelength of each pulse of light during each pulse; and

guiding said pulses of light both to said sample, and to a reference arm, and obtaining an inteference fringe between reflections of light.

18. (Unchanged) A method as in claim 17, wherein said illuminating produces pulses more frequently than 1kHz.

19. (Unchanged) A method as in claim 17, further comprising placing said sample in an enclosed area, with a transparent viewport; and

compensating for optical effects of said viewport.

20. (Amended) A method as in claim 17, further comprising varying a phase between said light source and said movement of said [MEMS device] sample.

21. (Unchanged) A method as in claim 17, further comprising integrating the measuring over a plurality of cycles.